FIG.1

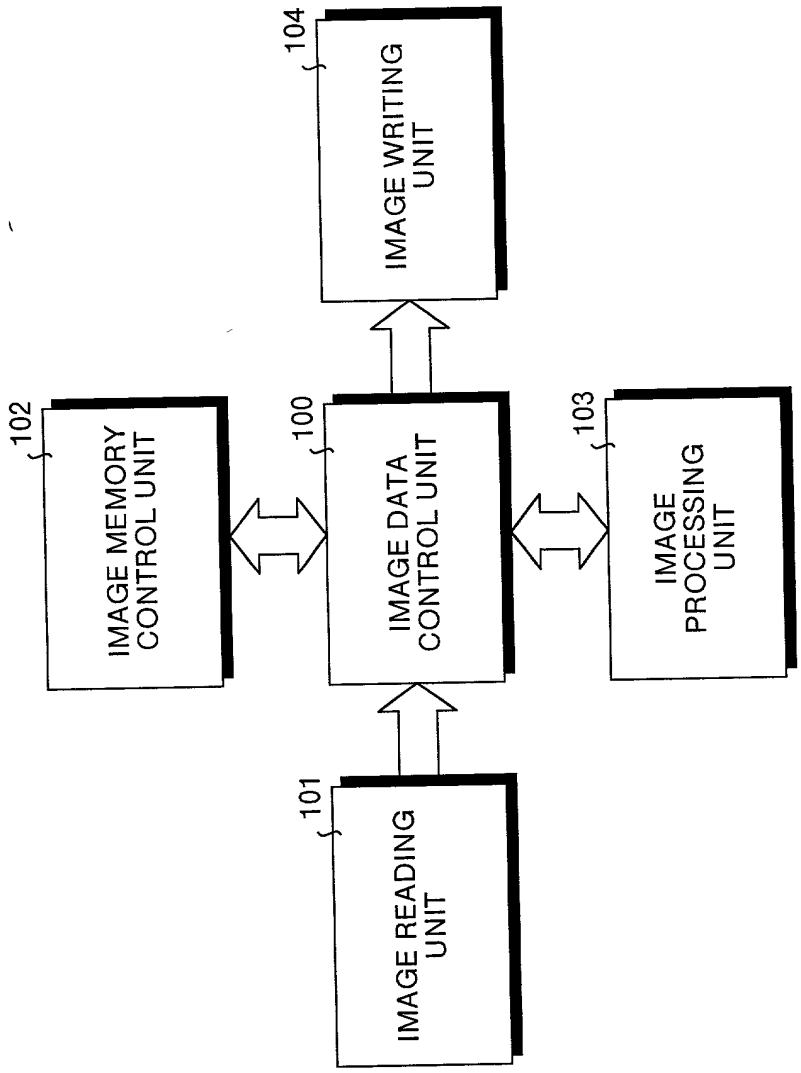
104
IMAGE WRITING UNIT
102
IMAGE MEMORY CONTROL UNIT
100
IMAGE DATA CONTROL UNIT
103
IMAGE PROCESSING UNIT
101
IMAGE READING UNIT

FIG.2

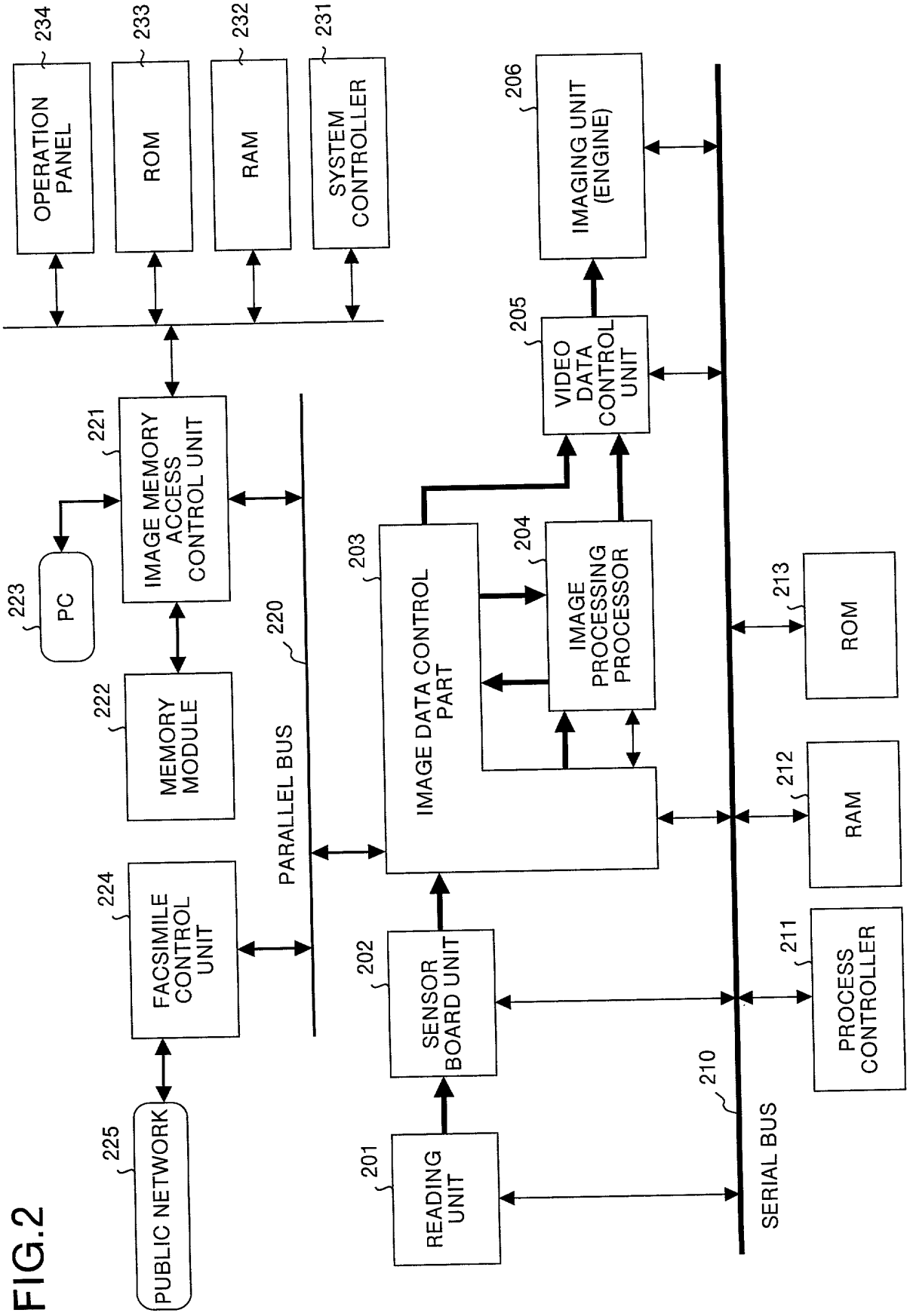
OPERATION PANEL
234
ROM
233
RAM
232
SYSTEM CONTROLLER
231
IMAGING UNIT (ENGINE)
206
VIDEO DATA CONTROL UNIT
205
IMAGE MEMORY ACCESS CONTROL UNIT
221
PC
223
MEMORY MODULE
222
PARALLEL BUS
220
IMAGE DATA CONTROL PART
203
IMAGE PROCESSING PROCESSOR
204
ROM
213
RAM
212
FACSIMILE CONTROL UNIT
224
SENSOR BOARD UNIT
202
PROCESS CONTROLLER
211
PUBLIC NETWORK
225
READING UNIT
201
SERIAL BUS
210

FIG.3

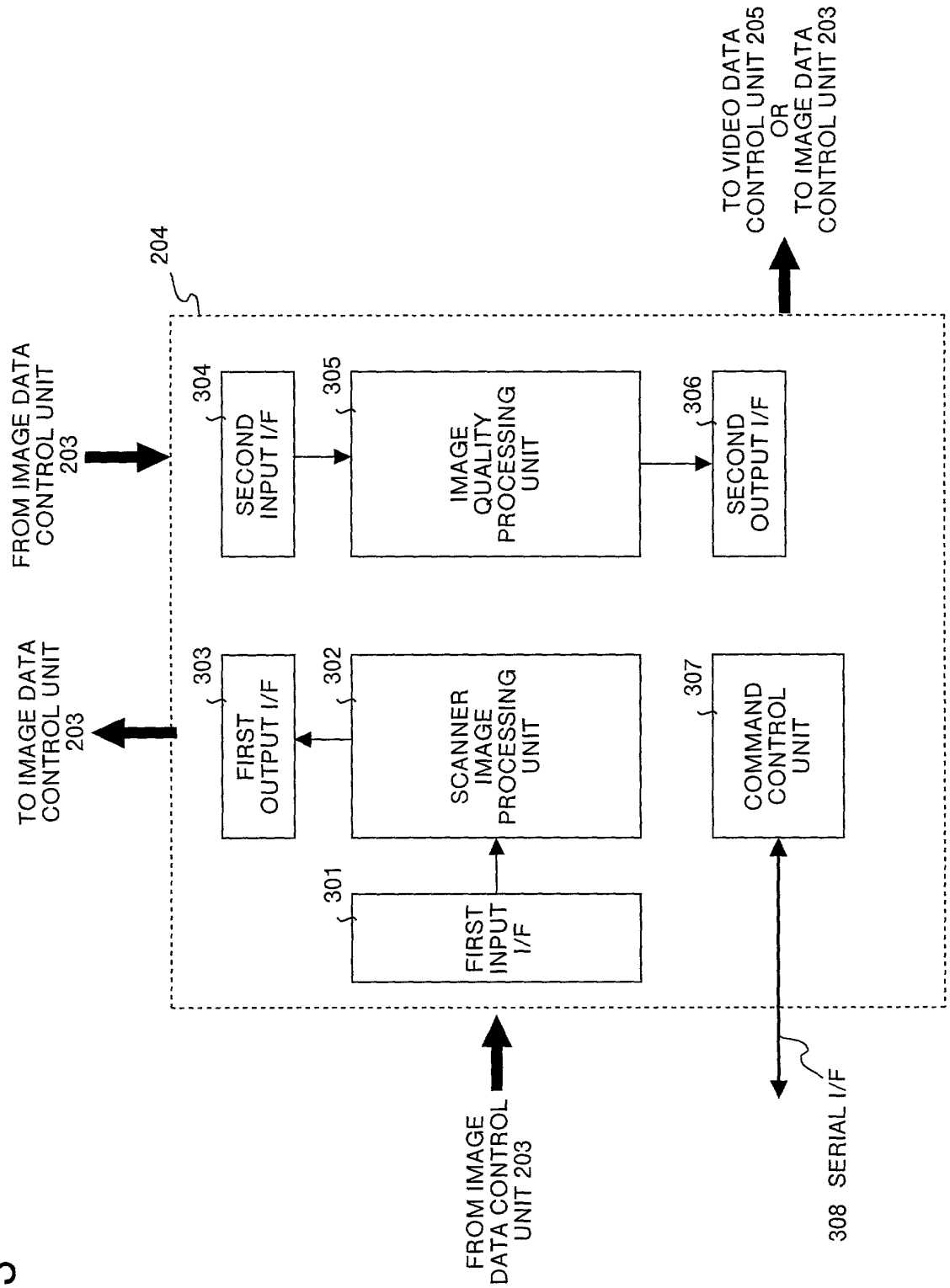
204
FROM IMAGE DATA CONTROL UNIT 203
TO IMAGE DATA CONTROL UNIT 203
TO VIDEO DATA CONTROL UNIT 205 OR TO IMAGE DATA CONTROL UNIT 203
304 SECOND INPUT I/F
305 IMAGE QUALITY PROCESSING UNIT
306 SECOND OUTPUT I/F
303 FIRST OUTPUT I/F
302 SCANNER IMAGE PROCESSING UNIT
307 COMMAND CONTROL UNIT
301 FIRST INPUT I/F
FROM IMAGE DATA CONTROL UNIT 203
308 SERIAL I/F

FIG.4

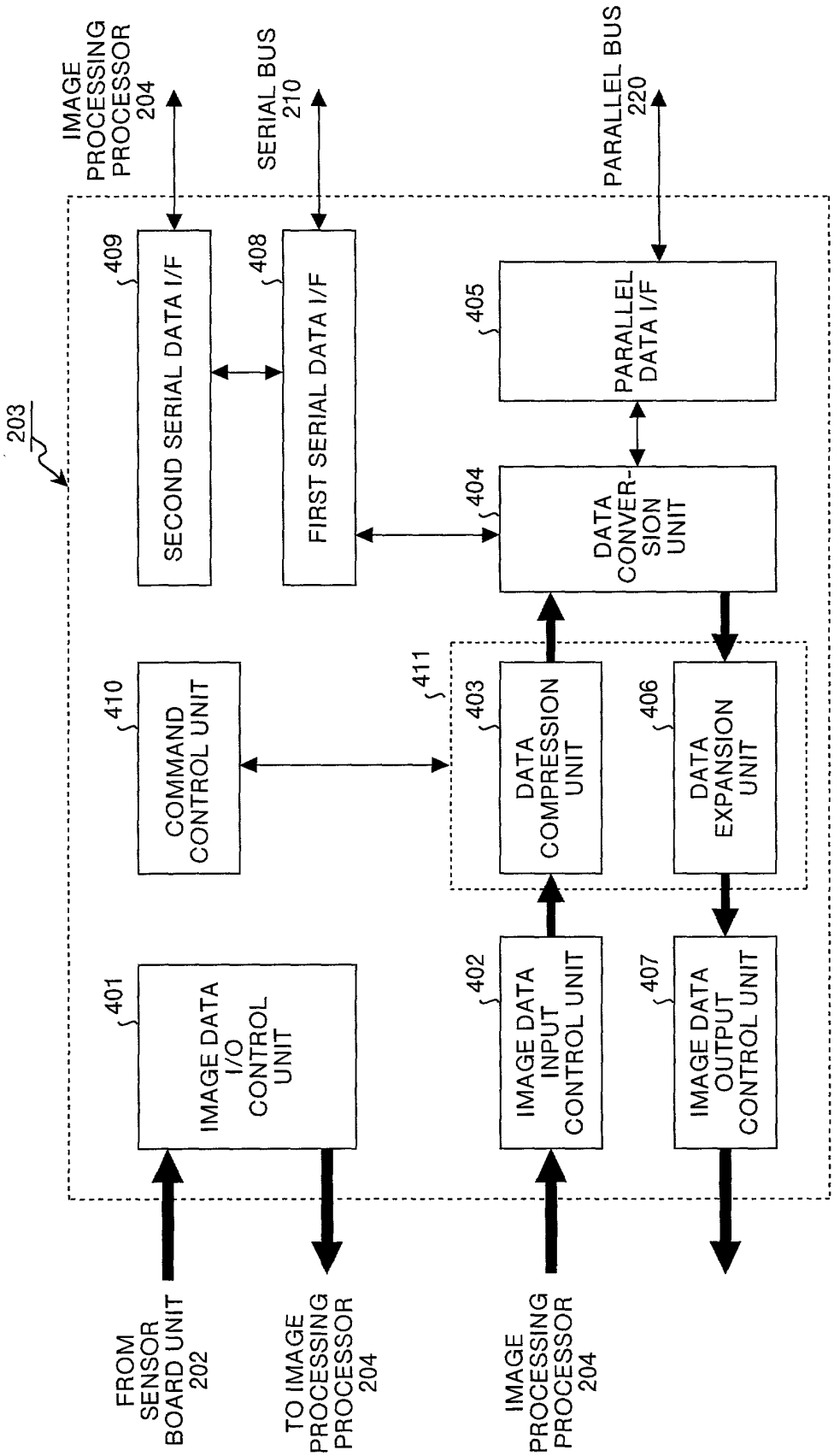
IMAGE PROCESSING PROCESSOR 204
SERIAL BUS 210
PARALLEL BUS 220
203
409
SECOND SERIAL DATA I/F
408
FIRST SERIAL DATA I/F
405
PARALLEL DATA I/F
404
DATA CONVER-SION UNIT
411
410
COMMAND CONTROL UNIT
403
DATA COMPRESSION UNIT
406
DATA EXPANSION UNIT
401
IMAGE DATA I/O CONTROL UNIT
402
IMAGE DATA INPUT CONTROL UNIT
407
IMAGE DATA OUTPUT CONTROL UNIT
FROM SENSOR BOARD UNIT 202
TO IMAGE PROCESSING PROCESSOR 204
IMAGE PROCESSING PROCESSOR 204

FIG.5

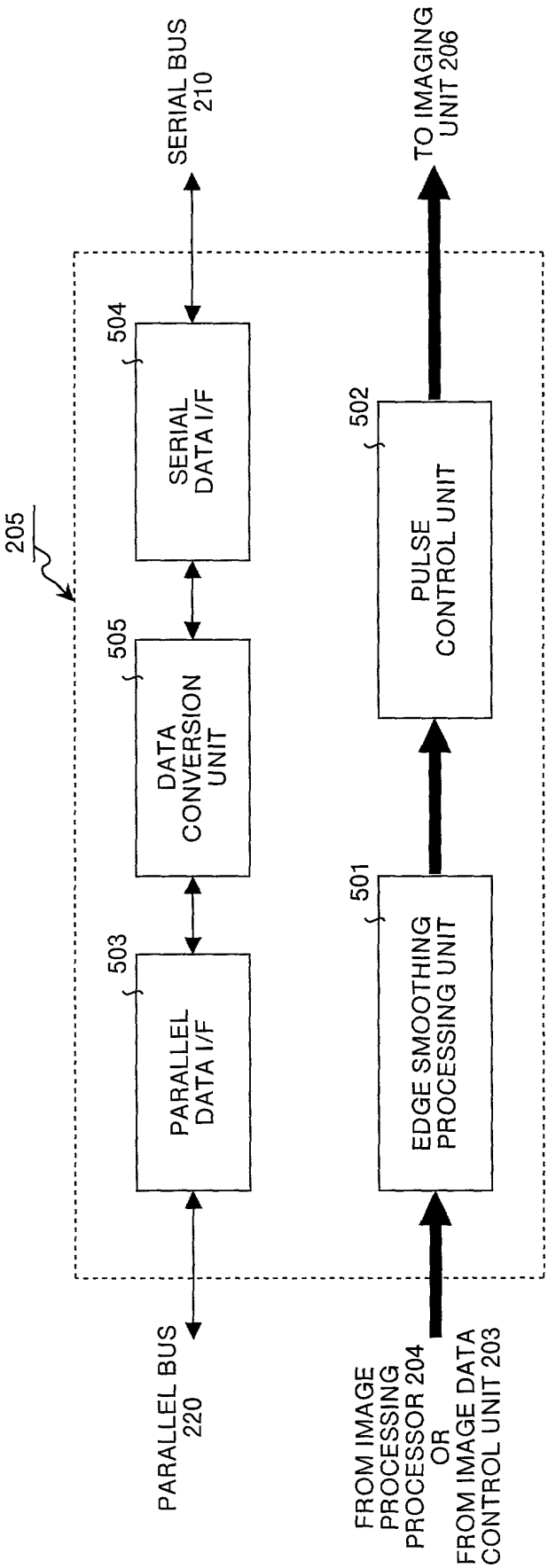
205
504
SERIAL DATA I/F
505
DATA CONVERSION UNIT
503
PARALLEL DATA I/F
501
EDGE SMOOTHING PROCESSING UNIT
502
PULSE CONTROL UNIT
SERIAL BUS 210
TO IMAGING UNIT 206
PARALLEL BUS 220
FROM IMAGE PROCESSING PROCESSOR 204 OR FROM IMAGE DATA CONTROL UNIT 203

FIG.6

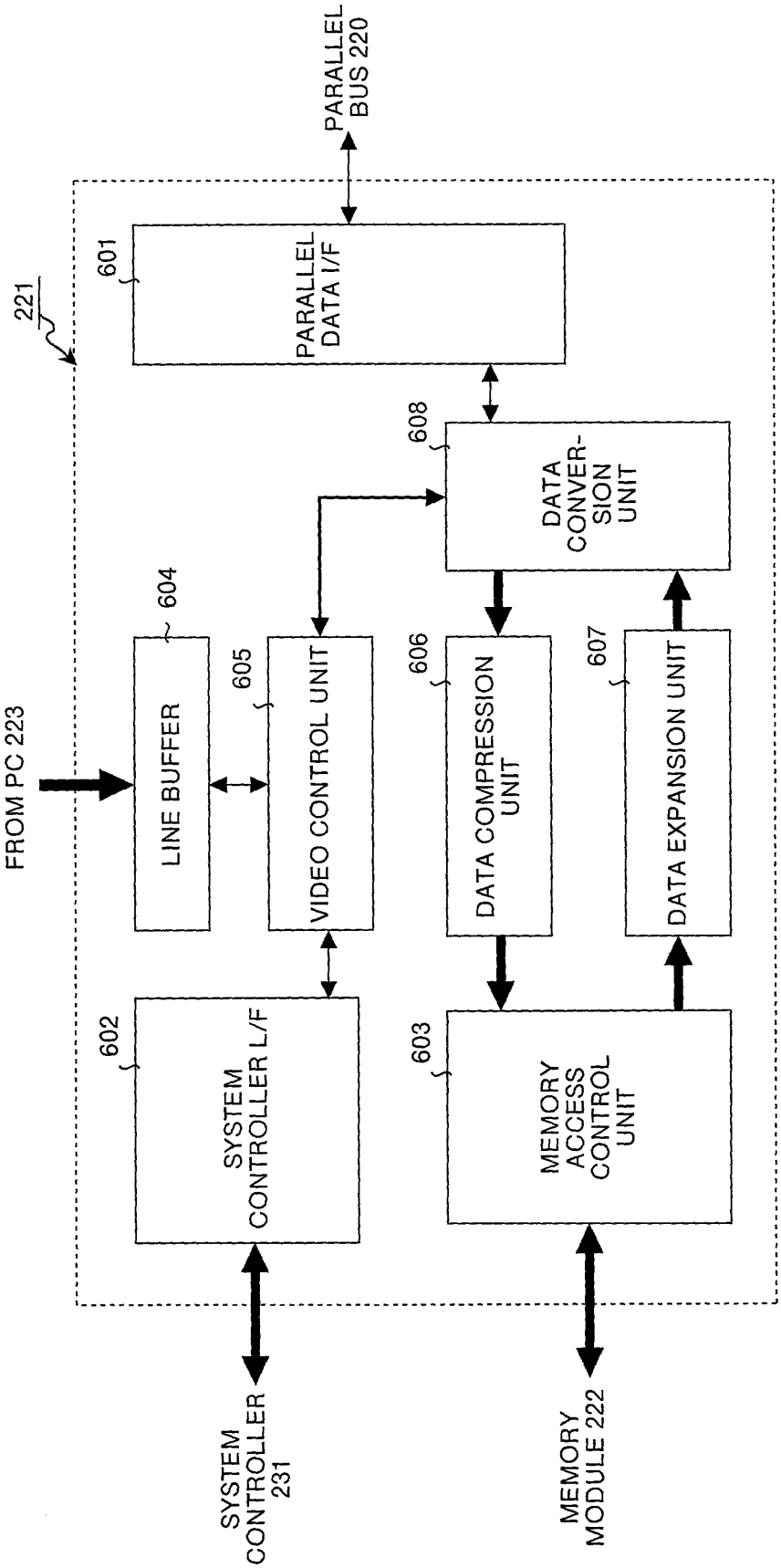
PARALLEL BUS 220
221
601
PARALLEL DATA I/F
608
DATA CONVER-SION UNIT
604
605
606
607
FROM PC 223
LINE BUFFER
VIDEO CONTROL UNIT
DATA COMPRESSION UNIT
DATA EXPANSION UNIT
602
603
SYSTEM CONTROLLER L/F
MEMORY ACCESS CONTROL UNIT
SYSTEM CONTROLLER 231
MEMORY MODULE 222

FIG.7

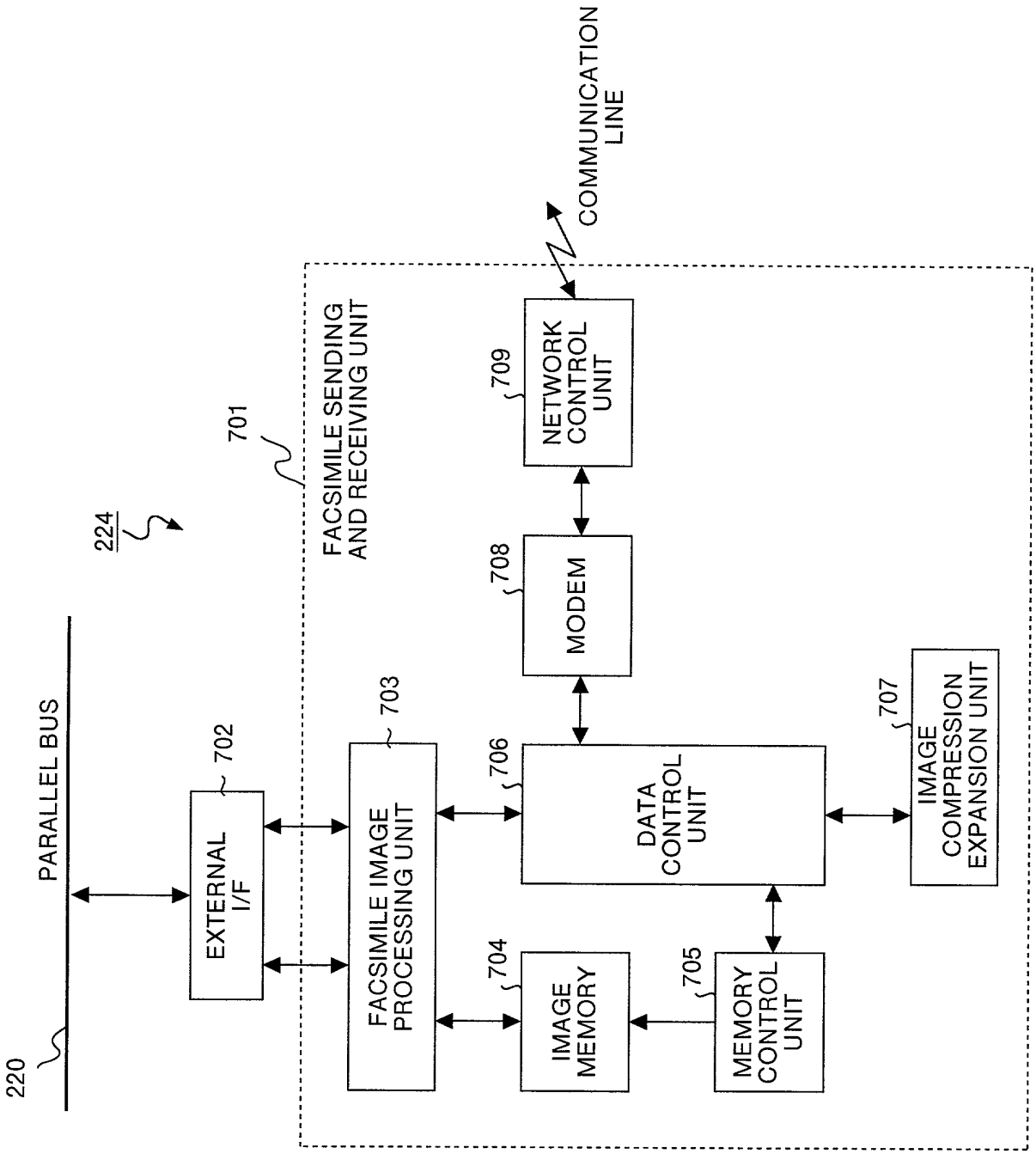
220
PARALLEL BUS
224
701
FACSIMILE SENDING AND RECEIVING UNIT
COMMUNICATION LINE
EXTERNAL I/F
702
FACSIMILE IMAGE PROCESSING UNIT
703
IMAGE MEMORY
704
MEMORY CONTROL UNIT
705
DATA CONTROL UNIT
706
IMAGE COMPRESSION EXPANSION UNIT
707
MODEM
708
NETWORK CONTROL UNIT
709

FIG.8

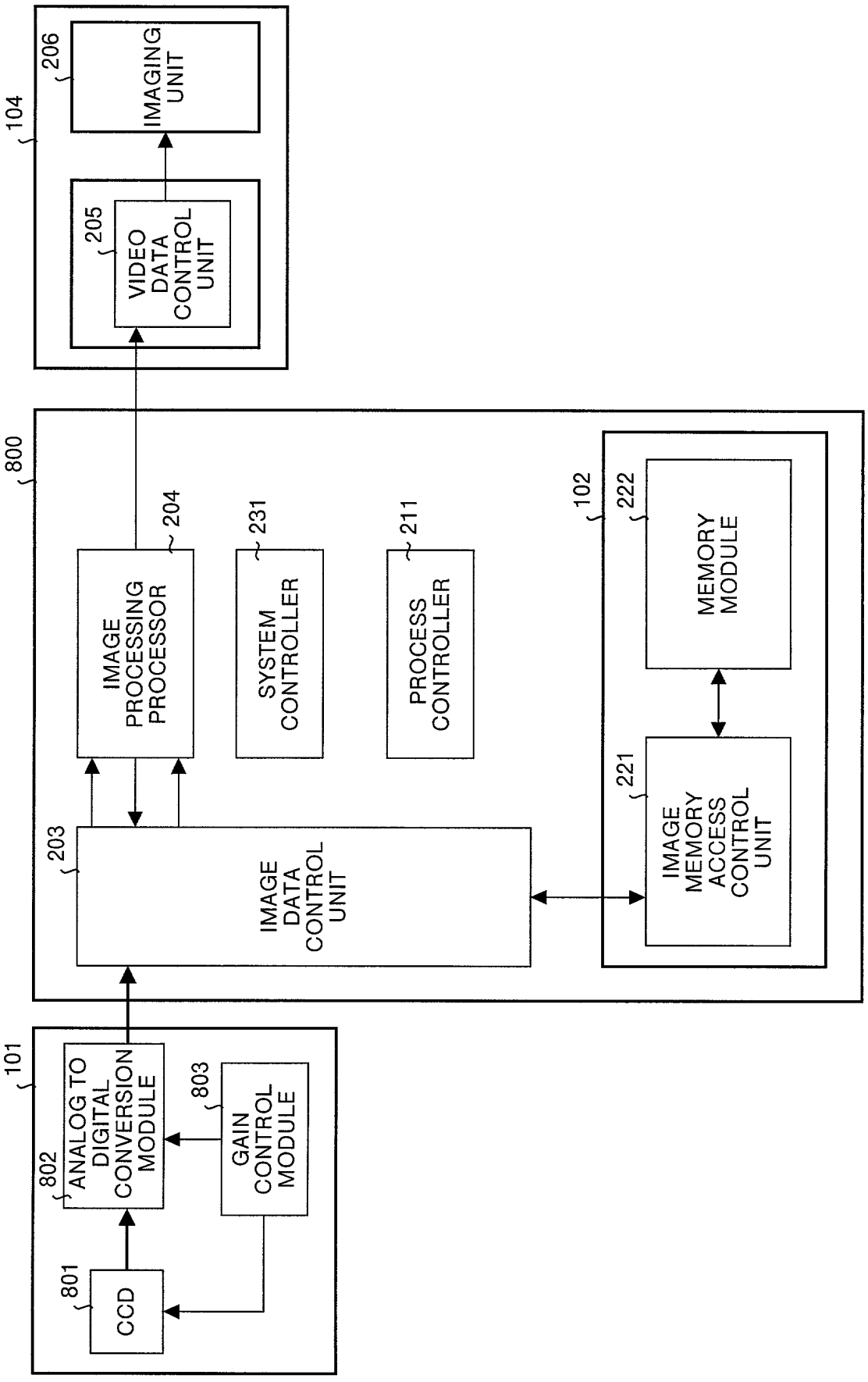
104
206
IMAGING UNIT
205
VIDEO DATA CONTROL UNIT
800
204
IMAGE PROCESSING PROCESSOR
231
SYSTEM CONTROLLER
211
PROCESS CONTROLLER
102
222
MEMORY MODULE
221
IMAGE MEMORY ACCESS CONTROL UNIT
203
IMAGE DATA CONTROL UNIT
101
802
ANALOG TO DIGITAL CONVERSION MODULE
803
GAIN CONTROL MODULE
801
CCD

FIG.9

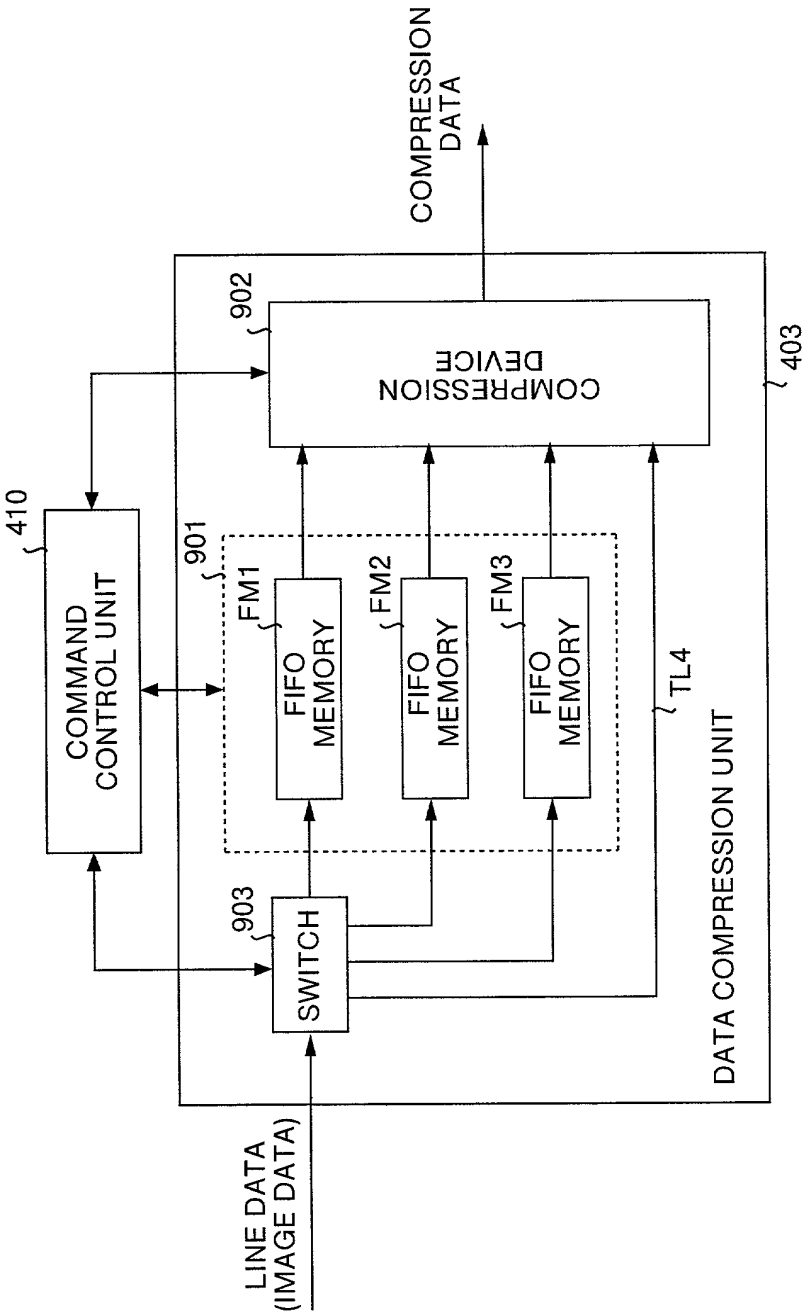
COMPRESSION DATA
902
COMPRESSION DEVICE
403
410
COMMAND CONTROL UNIT
901
FM1
FIFO MEMORY
FM2
FIFO MEMORY
FM3
FIFO MEMORY
TL4
903
SWITCH
DATA COMPRESSION UNIT
LINE DATA (IMAGE DATA)

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FIG.10

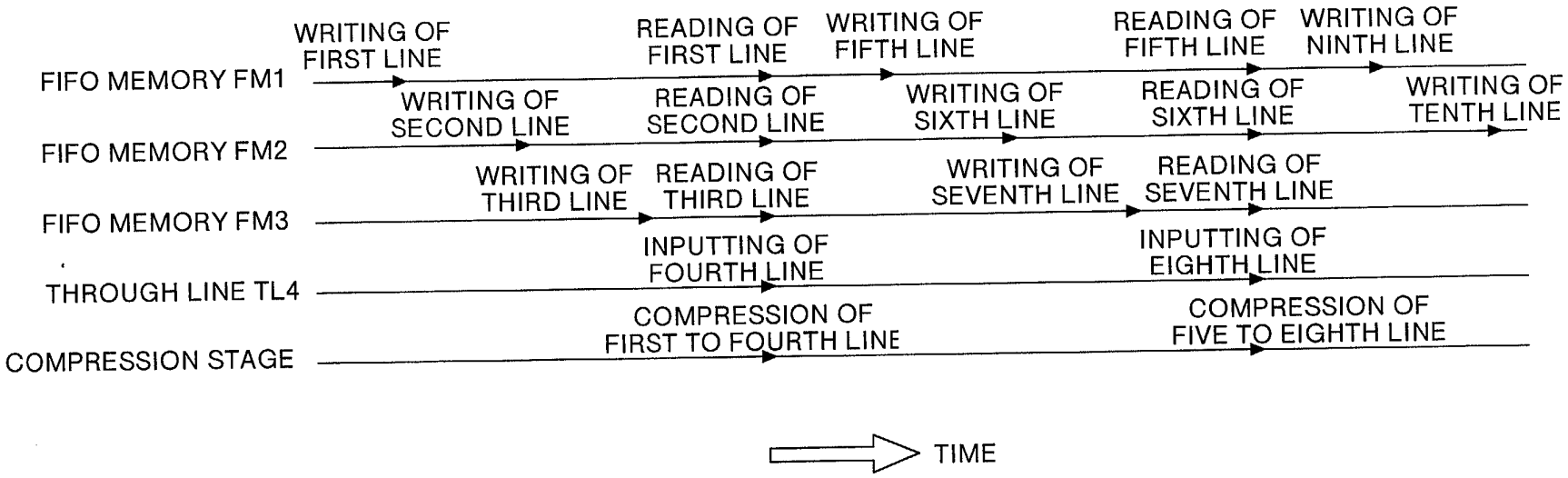

FIG.11

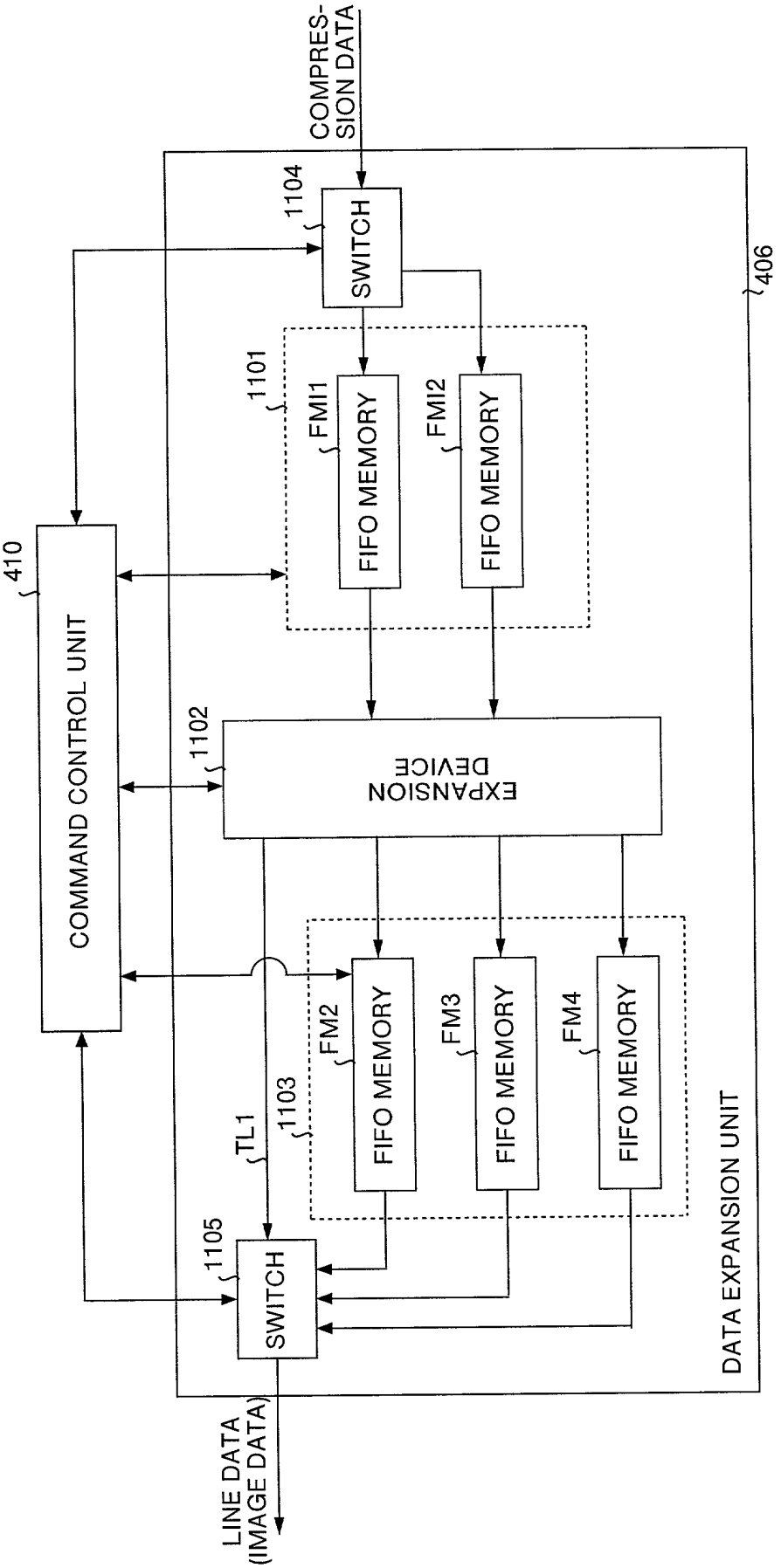
COMPRES-
SION DATA
1104
SWITCH
406
1101
FMI1
FIFO MEMORY
FMI2
FIFO MEMORY
410
COMMAND CONTROL UNIT
1102
EXPANSION
DEVICE
FM2
FIFO MEMORY
FM3
FIFO MEMORY
FM4
FIFO MEMORY
TL1
1103
1105
SWITCH
DATA EXPANSION UNIT
LINE DATA
(IMAGE DATA)

FIG.12

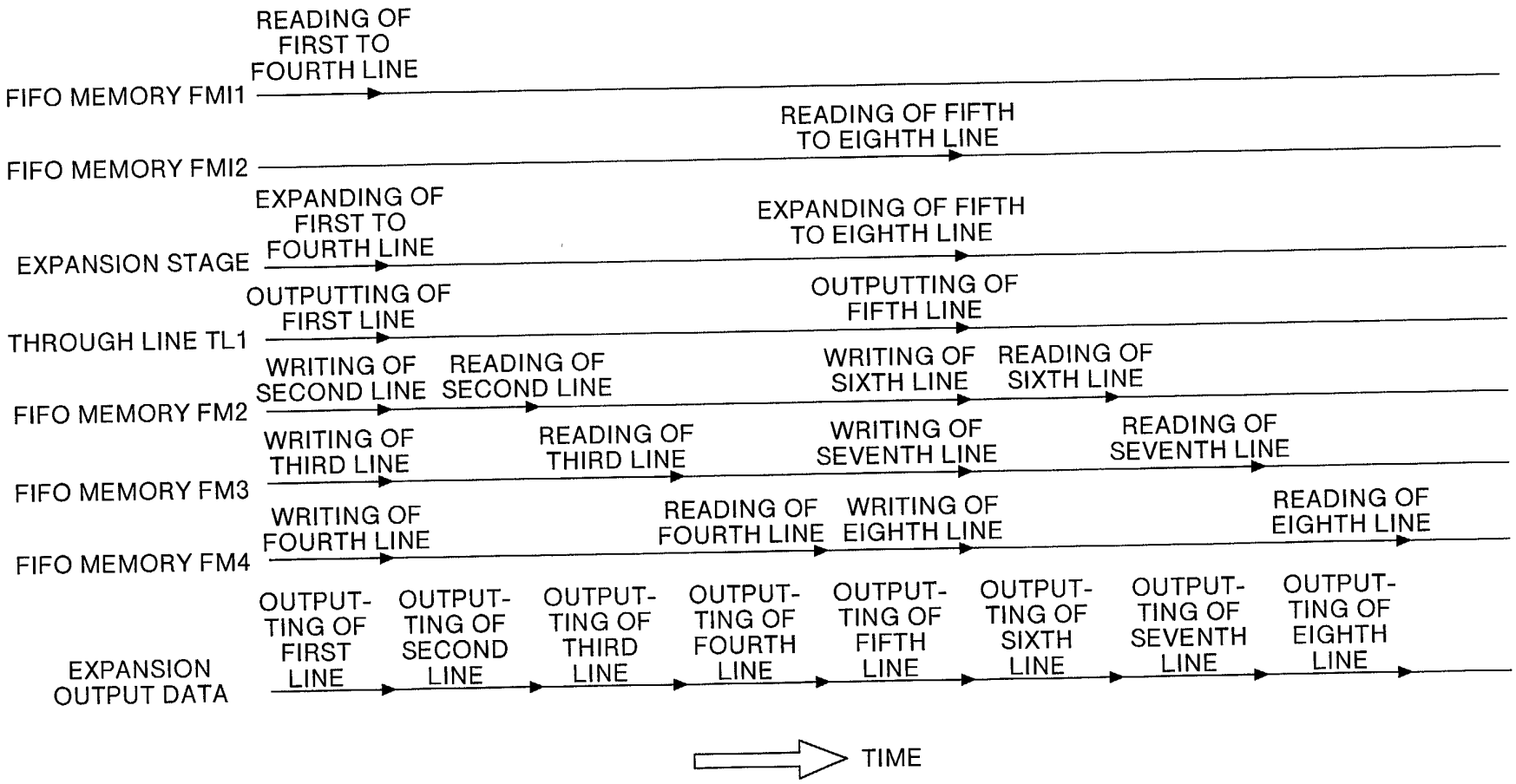
READING OF FIRST TO FOURTH LINE
FIFO MEMORY FMI1
READING OF FIFTH TO EIGHTH LINE
FIFO MEMORY FMI2
EXPANDING OF FIRST TO FOURTH LINE
EXPANSION STAGE
EXPANDING OF FIFTH TO EIGHTH LINE
OUTPUTTING OF FIRST LINE
THROUGH LINE TL1
OUTPUTTING OF FIFTH LINE
WRITING OF SECOND LINE
READING OF SECOND LINE
WRITING OF SIXTH LINE
READING OF SIXTH LINE
FIFO MEMORY FM2
WRITING OF THIRD LINE
READING OF THIRD LINE
WRITING OF SEVENTH LINE
READING OF SEVENTH LINE
FIFO MEMORY FM3
WRITING OF FOURTH LINE
READING OF FOURTH LINE
WRITING OF EIGHTH LINE
READING OF EIGHTH LINE
FIFO MEMORY FM4
OUTPUT-TING OF FIRST LINE
OUTPUT-TING OF SECOND LINE
OUTPUT-TING OF THIRD LINE
OUTPUT-TING OF FOURTH LINE
OUTPUT-TING OF FIFTH LINE
OUTPUT-TING OF SIXTH LINE
OUTPUT-TING OF SEVENTH LINE
OUTPUT-TING OF EIGHTH LINE
EXPANSION OUTPUT DATA
TIME

FIG.13

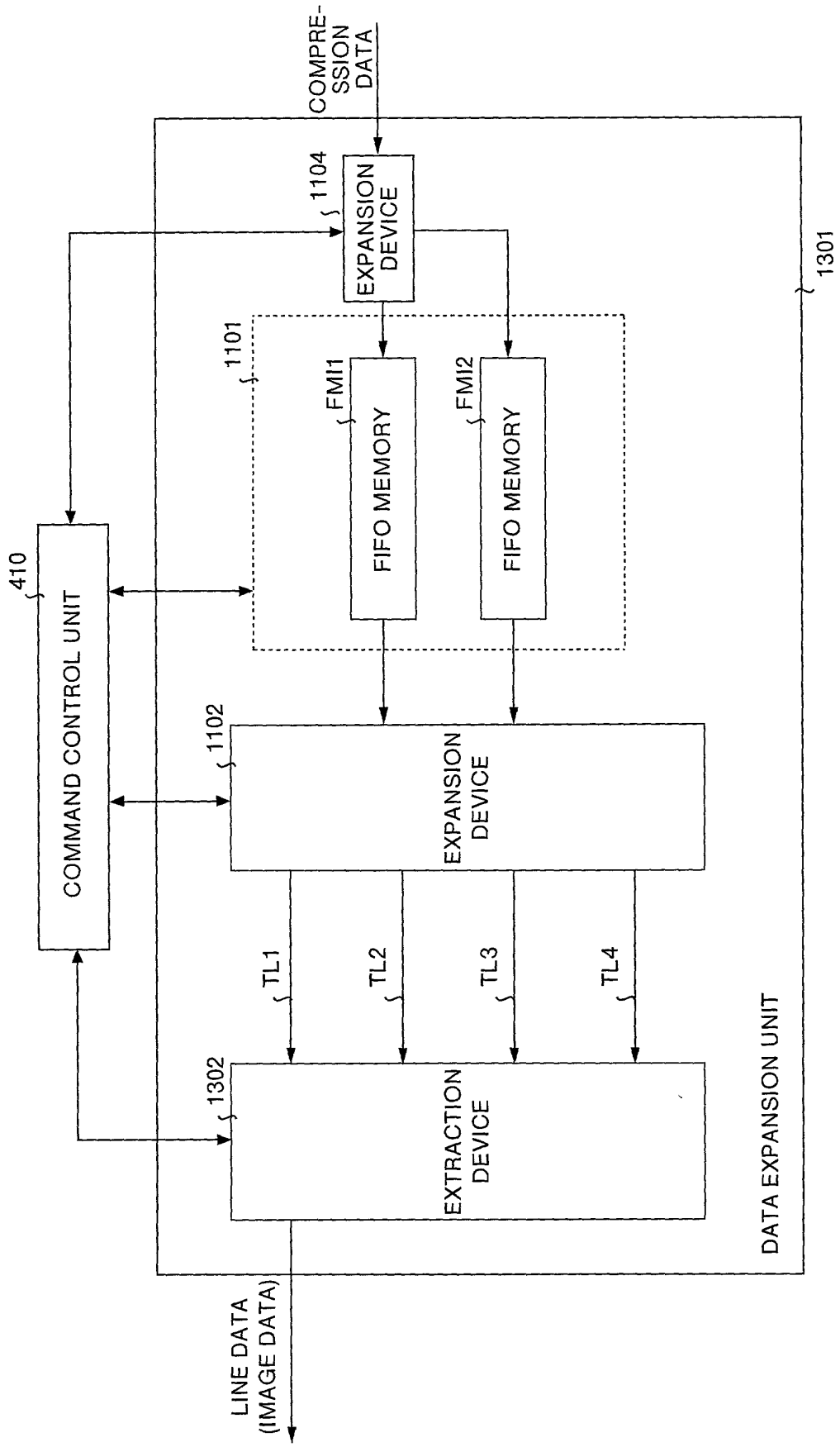
COMPRE-
SSION
DATA
1104
EXPANSION
DEVICE
1301
1101
FMI1
FIFO MEMORY
FMI2
FIFO MEMORY
410
COMMAND CONTROL UNIT
1102
EXPANSION
DEVICE
TL1
TL2
TL3
TL4
1302
EXTRACTION
DEVICE
DATA EXPANSION UNIT
LINE DATA
(IMAGE DATA)

FIG.14

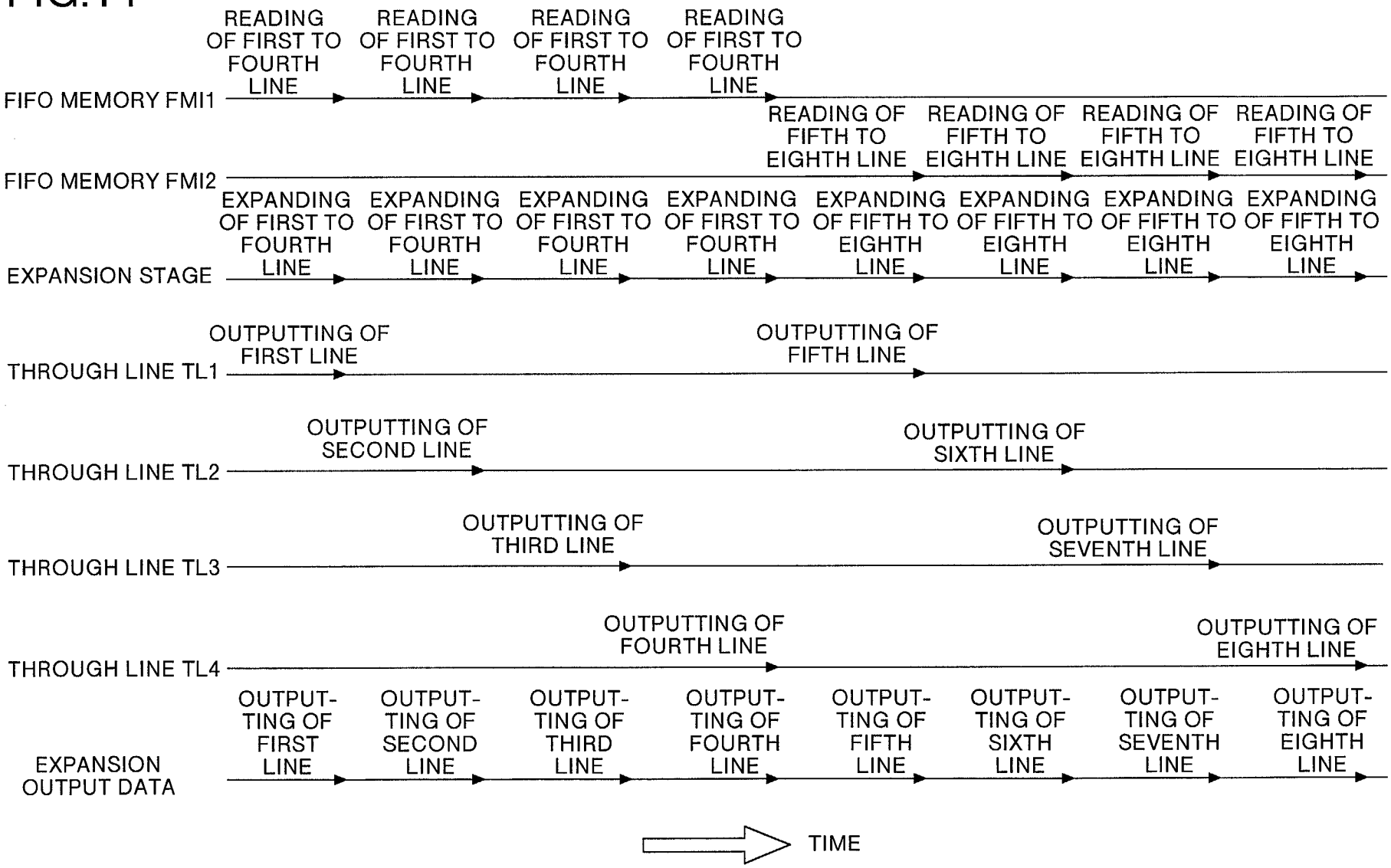

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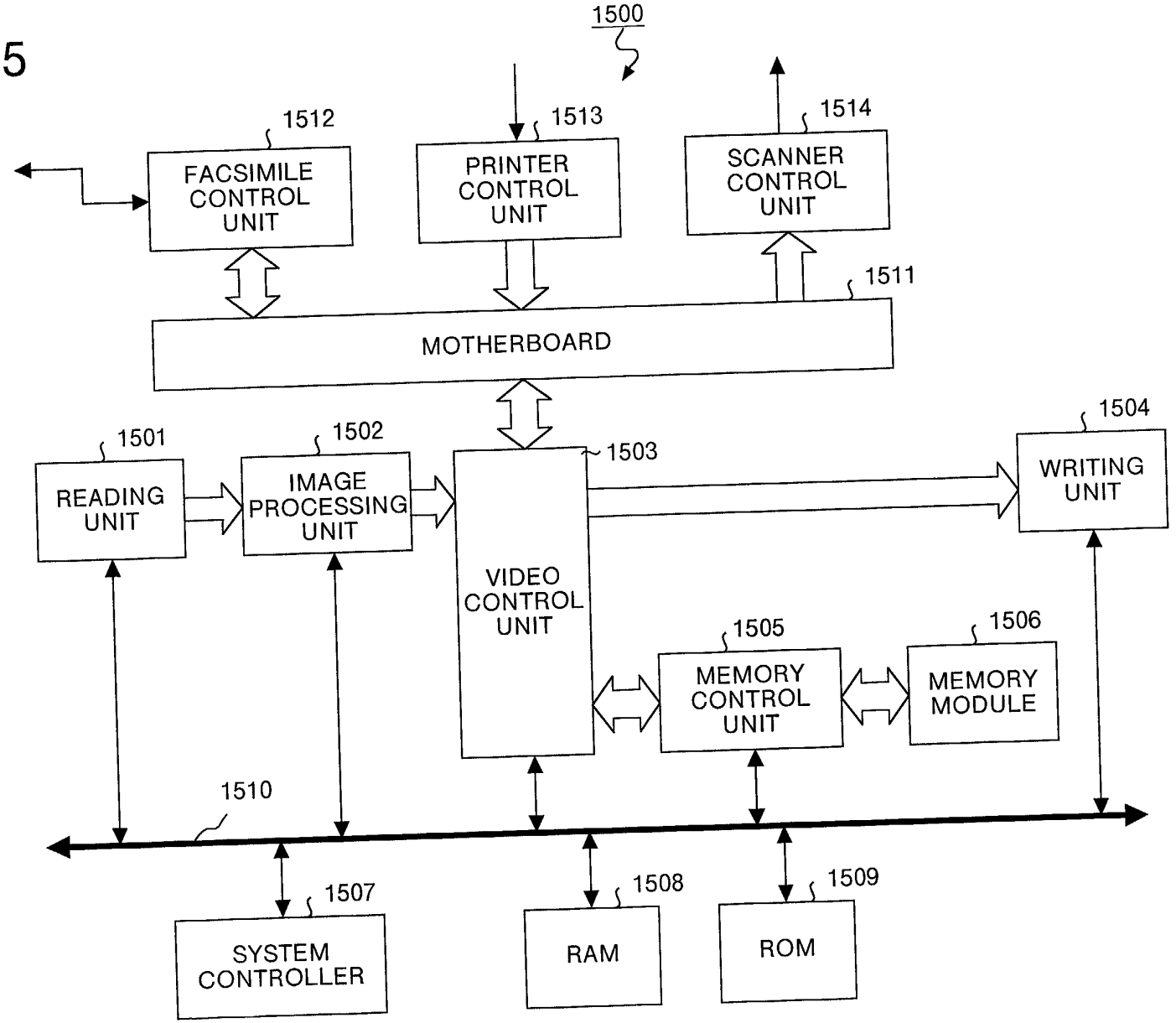
FIG.15



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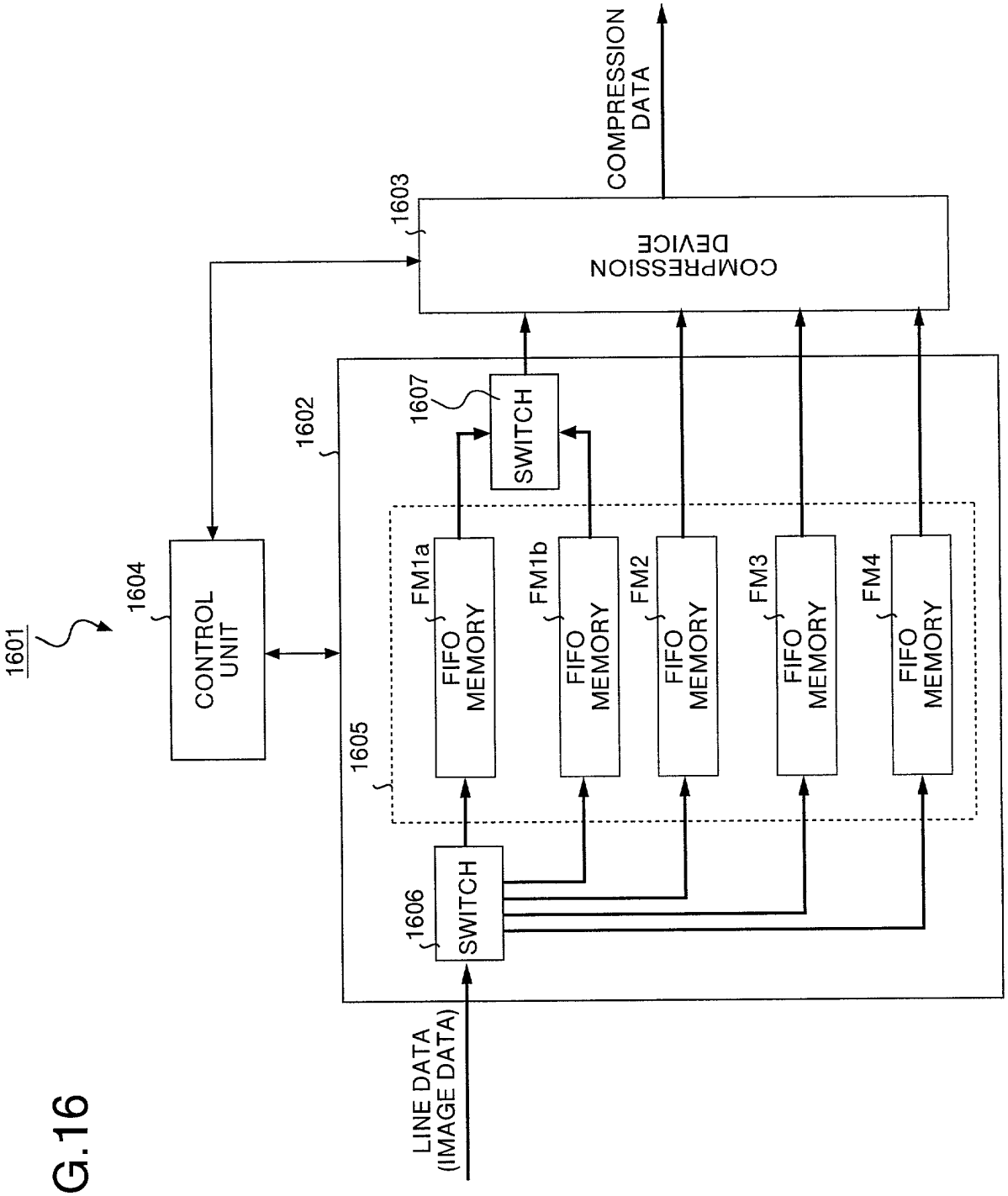
1601
1604
CONTROL UNIT
1602
1603
COMPRESSION DEVICE
COMPRESSION DATA
1607
SWITCH
FM1a
FIFO MEMORY
FM1b
FIFO MEMORY
FM2
FIFO MEMORY
FM3
FIFO MEMORY
FM4
FIFO MEMORY
1605
1606
SWITCH
LINE DATA (IMAGE DATA)

FIG.16

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FIG.17

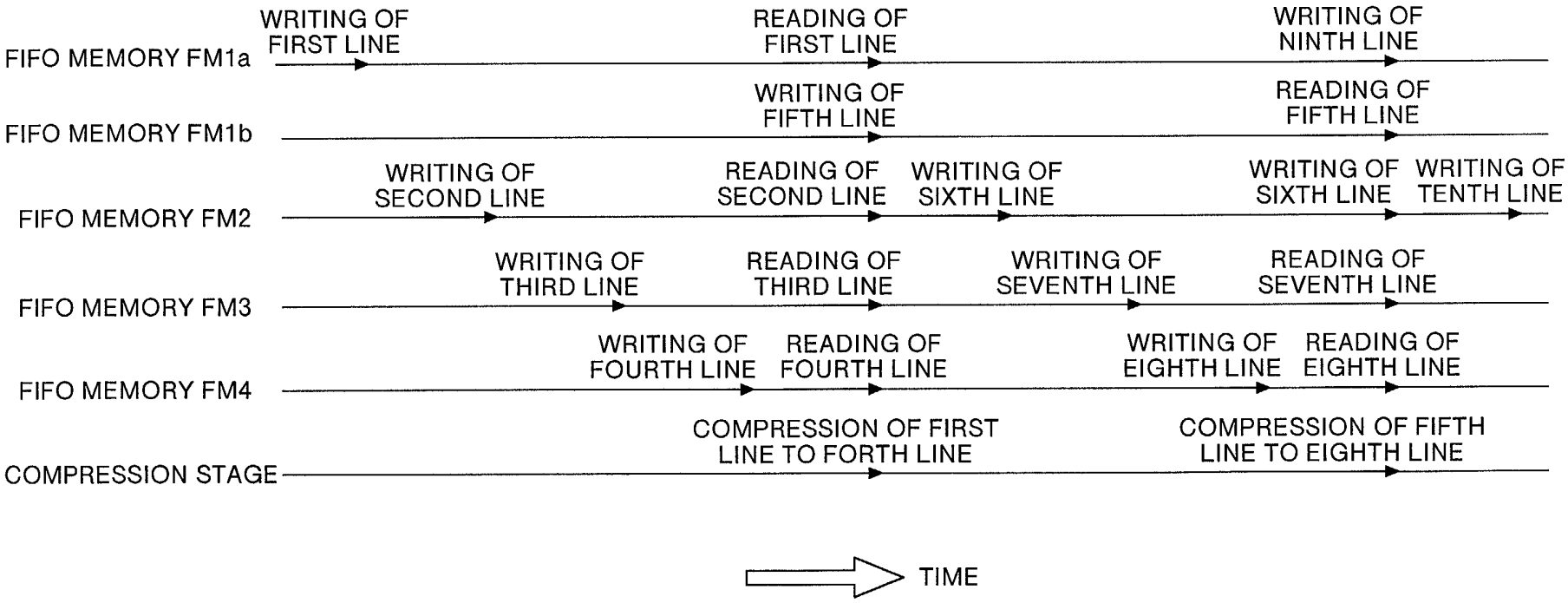
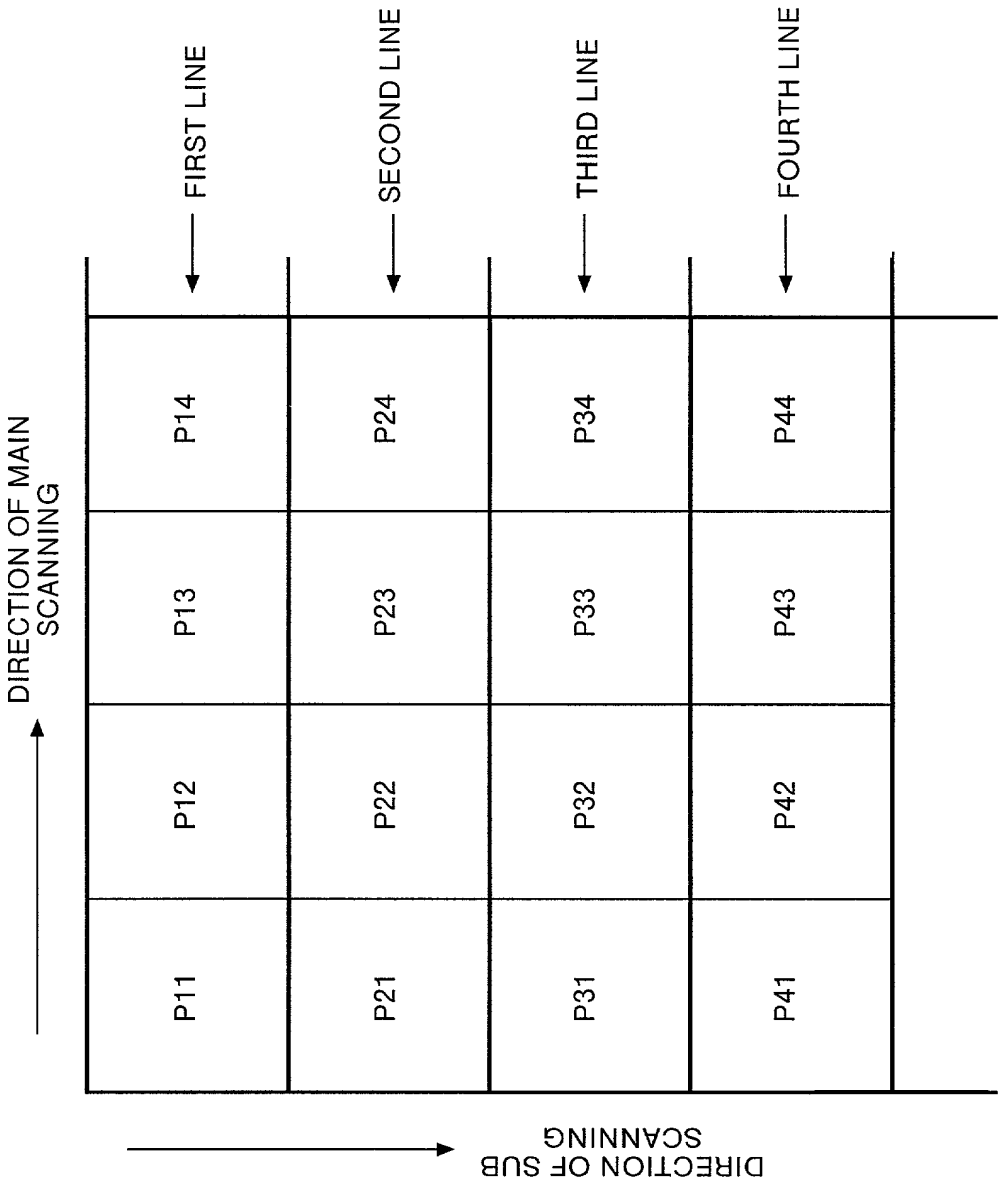


FIG.18


FIRST LINE
SECOND LINE
THIRD LINE
FOURTH LINE
P14
P24
P34
P44
P13
P23
P33
P43
P12
P22
P32
P42
P11
P21
P31
P41
DIRECTION OF MAIN SCANNING
DIRECTION OF SUB SCANNING

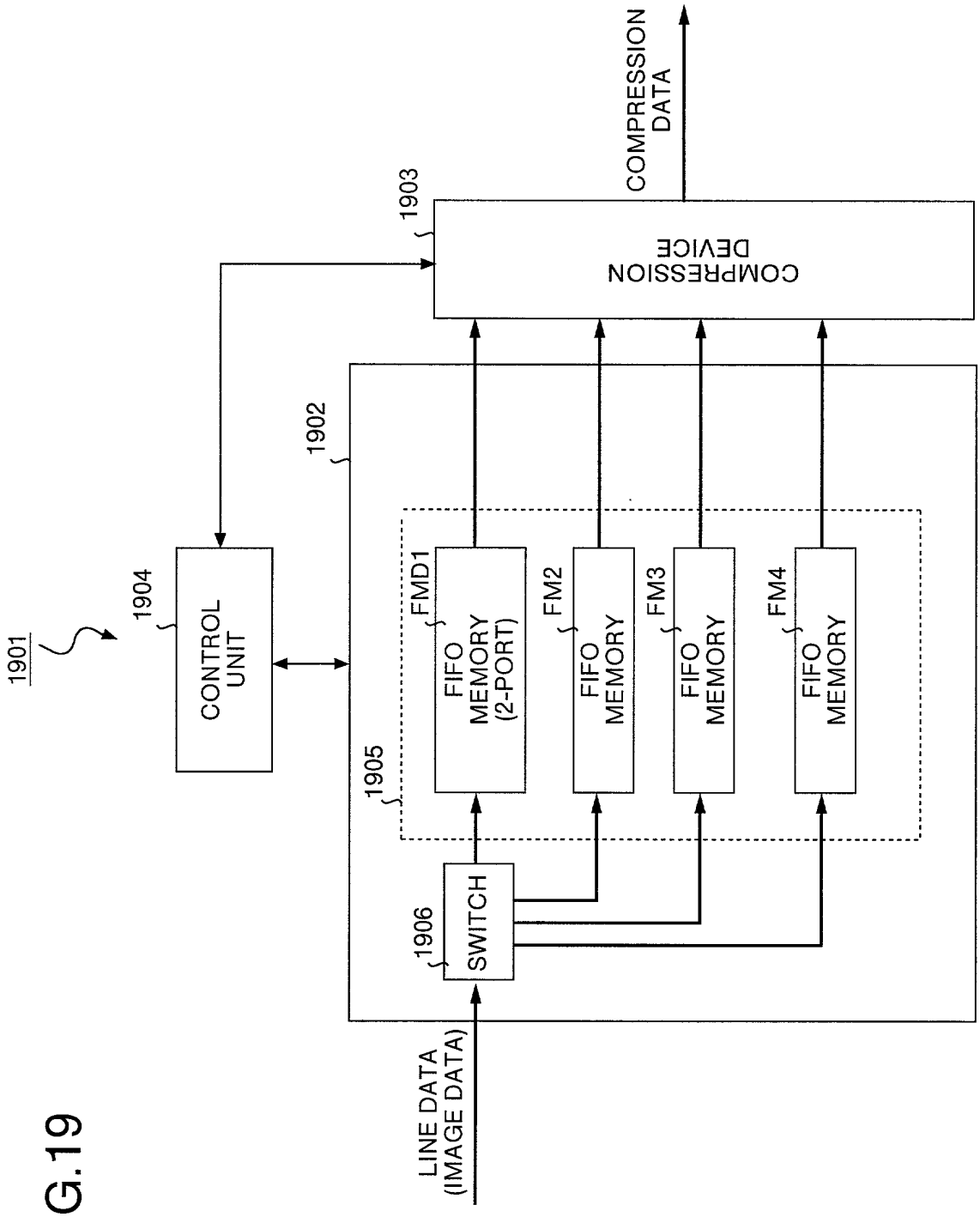

1901
1904
CONTROL UNIT
1902
1903
COMPRESSION DEVICE
COMPRESSION DATA
1905
FMD1
FIFO MEMORY (2-PORT)
FM2
FIFO MEMORY
FM3
FIFO MEMORY
FM4
FIFO MEMORY
1906
SWITCH
LINE DATA (IMAGE DATA)

FIG.19

PATENT APPLICATION

FIG.20

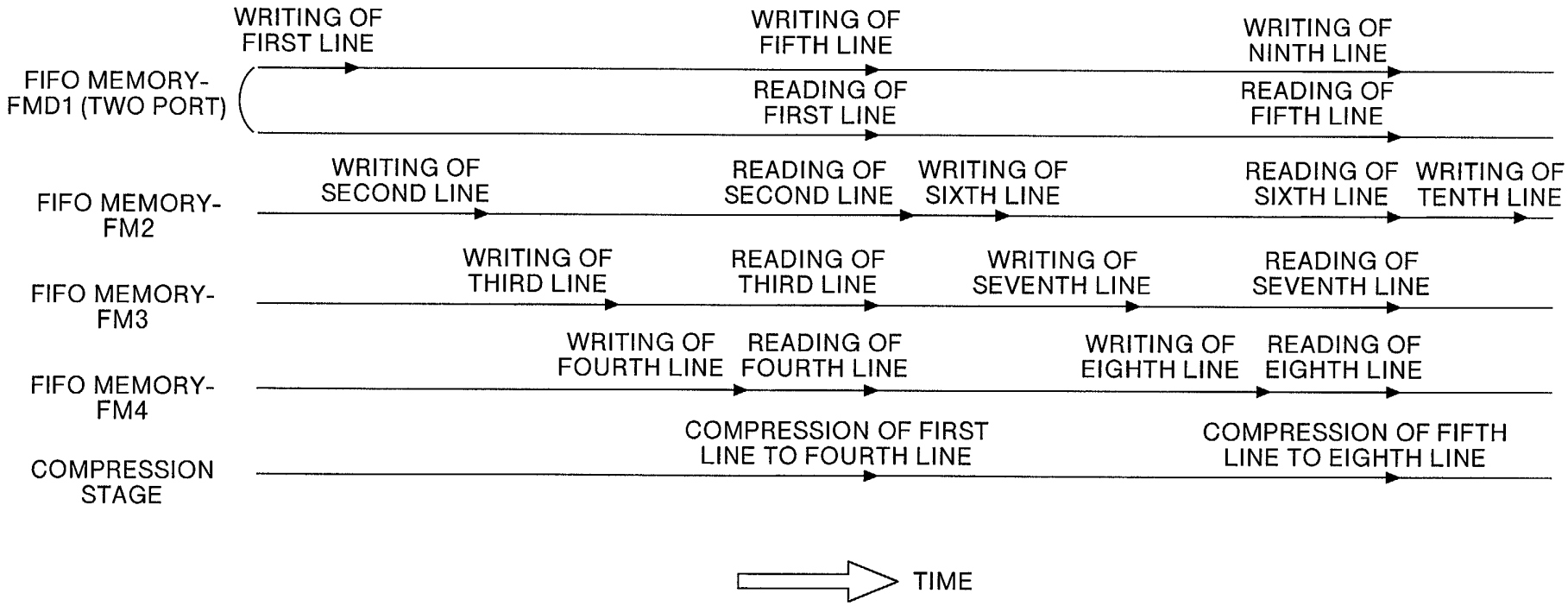


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FIG.21

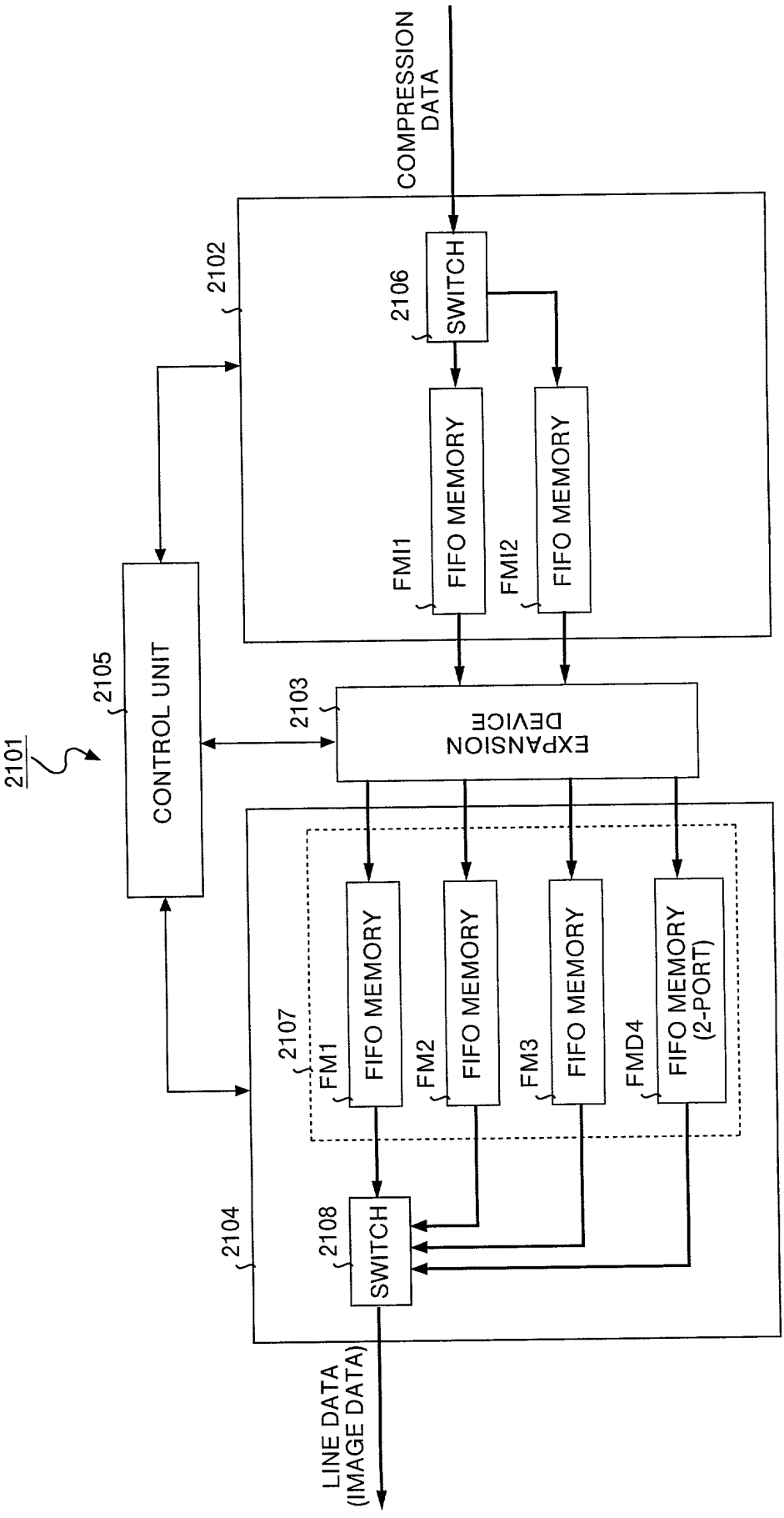
2101
CONTROL UNIT
2105
2103
EXPANSION DEVICE
2102
2106
SWITCH
COMPRESSION DATA
FMI1
FIFO MEMORY
FMI2
FIFO MEMORY
2104
2107
FM1
FIFO MEMORY
FM2
FIFO MEMORY
FM3
FIFO MEMORY
FMD4
FIFO MEMORY (2-PORT)
2108
SWITCH
LINE DATA (IMAGE DATA)

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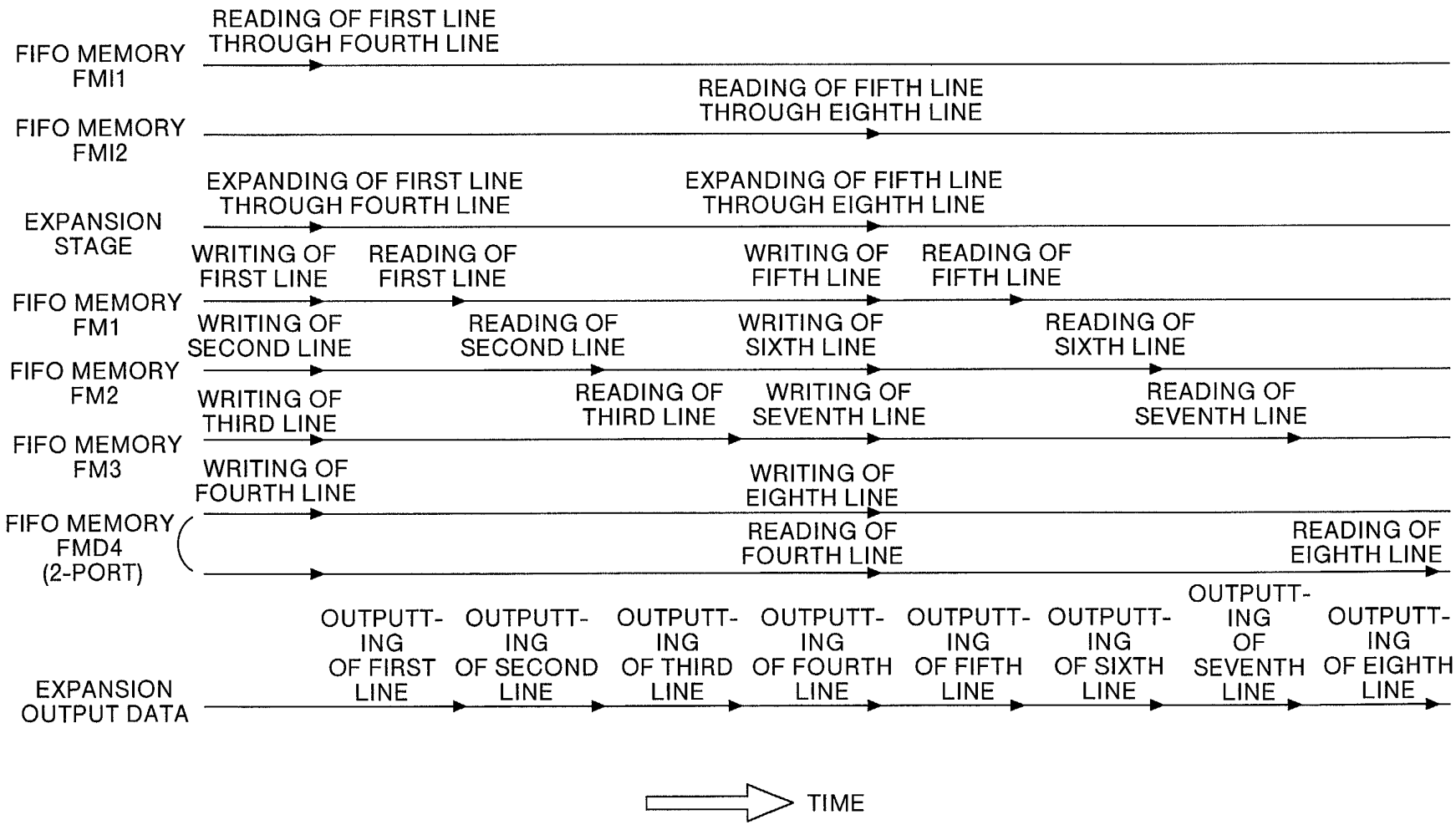
FIG.22



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